VERIFICATION OF TRANSLATION

I, HOSOKAWA Junko, a citizen of Japan, currently residing at 8-19-427, Shinchujocho, Ibaraki-shi, Osaka, Japan, 567-0872, hereby declare:

That I am fully familiar with the English language and with the Japanese language in which the accompanying Japanese patent application No. 2001-142392 was prepared;

That the annexed English text is believed by me to be a true and accurate translation of the text of Japanese patent application No. 2001-142392; and

That all statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signed at <u>Osaka, Japan</u>
Date: <u>April 23, 2008</u>

Signature: _____
HOSOKAWA Junko

[TITLE OF DOCUMENT] SPECIFICATION

[TITLE OF THE INVENTION] IMAGE PROCESSING APPARATUS

[CLAIMS]

[CLAIM 1]

An image processing apparatus which comprises: an image processing section for carrying out a processing of image data, and at least two user interface sections for displaying information regarding said processing of image data and for entering commands on said processing of image data, wherein:

said at least two user interface sections are arranged such that in response to a command entered by one of said at least two user interface sections, other user interface section(s) of the at least two user interface sections change(s) its (their) display state.

[CLAIM 2]

The image processing apparatus as set forth in claim 1, wherein:

said at least two user interface sections are arranged such that when the information regarding said processing of image data is displayed in said one of the at least two interface sections, said other user interface section(s) of the at least two interface sections is (are) in non-display

state(s).

[CLAIM 3]

The image processing apparatus as set forth in claim 1 or 2, wherein:

said at least two user interface sections are arranged such that information regarding contents of the command entered by said one of the at least two user interface sections displays in said other of the at least two interface sections.

[DETAILED DESCRIPTION OF THE INVENTION]

[0001]

[INDUSTRIAL FIELD OF THE INVENTION] The present invention relates to an image processing apparatus provided with a plurality of user interface sections, which permits a selective use of the user interface sections for entering commands to execute a processing as desired and conforming a state of the processing, etc., examples of such image processing apparatus including a digital copying machine wherein an unit of an image input section (scanner section) and an unit of an image output section (printer section) are connected via an interface.

[0002]

[PRIOR ART] Conventionally, in an image processing

apparatus wherein a scanner unit and a printer unit are provided as separate members at a predetermined positional relationship, the scanner unit and the printer unit respectively provided with user interface sections are typically adopted. These user interface sections are used in displaying a variety of information, or entering commands to execute processing.

[0003] In the foregoing image processing apparatus provided with two user interface sections, either one of these user interface sections, which the user finds more convenient to use in its visibility and operability is mainly used. For example, in the typical structure of the image processing apparatus wherein the scanner unit and the printer unit are combined, the scanner unit is provided above the printer unit, for convenience in setting an original document or replacing the original document currently set with another original document. In this typical structure, the mainly used user interface section would be the user interface section of the scanner unit. Therefore, the user interface section of the scanner unit is conveniently situated for the user (in an upper part of the image forming apparatus). This interface section of the scanner unit would therefore be mainly used.

[0004] As an example of such conventional image

processing apparatus, Japanese Unexamined Patent Publication No. 8-297388/1996 (Tokukaihei 8-297388) discloses an image processing apparatus wherein display means of the scanner unit displays information on both a scanner unit and a printer unit, while display means of the printer unit displays information on only the printer unit.

[0005]

[PROBLEMS TO BE SOLVED BY THE INVENTION] However, in the conventional image forming apparatuses of the above publications, when the user enters a command for executing a processing, or checks a status of the processing, etc., the user's eyes are caught by both the information in the scanner-side display means and the information displayed in the printer-side display section. It is therefore difficult for the user to check the displayed information and recognize the contents thereof, resulting in poor operability. Particularly, when the user, who is not used to the image forming apparatus, operates the apparatus, the foregoing problem of making the user confused by the different information respectively displayed in the plurality of display means, and in this case, the operability would be more significantly lowered.

[0006] Namely, in the image forming apparatus

displayed in the above publication, information are displayed on the scanner-side display means and the printer-side display means, and therefore, it is likely that the operator gets confused, and for the user, the information displayed in the user interface is difficult to be recognized.

[0007] For example, in the structure wherein the scanner unit is provided above the printer unit, the user of the apparatus typically operates while observing the scanner-side display means. In this state, since the printer-side display means is hidden by the scanner unit, the user needs to crouch down to check the display on the printer-side display means.

[0008] Namely, in the conventional image forming apparatuses of the above publications, a large amount of information are typically displayed respectively in the plurality of display means which are provided at positions apart from other, which makes the operator difficult to recognize the contents of all the information. Namely, the image processing apparatus disclosed in the above publication has such drawback in that the information displayed in the user interfaces are difficult for the operator to recognize, resulting in poor operability. Particularly, in the case where the scanner-side display

means and the printer-side display means have mutually different display capacities or functions, the respective information would be displayed in different manner, and in this case, the problem of vexatious complication in recognizing the contents of the displayed information would become more serious.

[0009] The present invention is made in consideration of the problems, and an object thereof is to overcome the above and other drawbacks of the prior art and to provide an image processing apparatus of a desirable operability without a problem of vexatious complication, for example, even for a user who is not used to the image processing apparatus.

[0010]

[MEANS TO SOLVE THE PROBLEMS] In order to solve the problems, an image processing apparatus of the present invention is an image processing apparatus which includes: an image processing section for carrying out a processing of image data, and at least two user interface sections for displaying information regarding the processing of image data and for entering commands on the processing of image data, wherein: the at least two user interface sections are arranged such that in response to a command entered by one of the at least two user

interface sections, the other user interface section(s) of the at least two user interface sections change(s) its (their) display state(s).

[0011] According to the above structure of the present invention, the image processing apparatus provided with a plurality of user interface sections, which offers an improved operability and which is user-friendly can be realized.

[0012] In the conventional structure of the image processing apparatus provided with a plurality of user interface sections, typically, a plenty of information are always displayed respectively in the plurality of user interface sections which are positioned apart from each other, and therefore, such problem that the user gets confused in checking the contents of the information displayed in respective display sections, resulting in poor operability.

[0013] In view of the foregoing problem associated with the conventional structure, the image processing apparatus of the present invention includes (a) user interface section(s) which changes its display state in response to a command entered by one of the user interface sections. According to this structure, for example, when the specific user interface is used in

displaying information regarding the processing of image to be performed frequently and entering commands on that processing of image, other user interface section(s) than the specific user interface section can be set in non-display state. In this way, such problem that the user gets confused by the information displayed in other user interface section than the specific user interface section can be eliminated, and an improved operability of the image processing apparatus can therefore be achieved.

[0014] In the present invention, the display state indicates the state of the display in appearance visible by the user. Similarly, a change in display state indicates a change in the state of the display in appearance visible by the user, such as a change from a state of the user interface where some information is displayed to a state of the user interface where no information is displayed, or vice versa.

[0015] As described, the image processing apparatus of the present invention permits a selective use of the plurality of user interface sections according to the need. Therefore, even for multifunctional image processing apparatus, such problem of vexatious complication that a plenty of information are always displayed in the plurality of user interface sections, which makes the user confused,

can be avoided, and an improved operability can therefore be ensured. As a result, the image processing apparatus of desirable operability without the problem making the user confused can be realized.

[0016] It is preferable that the at least two user interface sections be arranged such that when the information regarding the processing of image data is displayed in one of the at least two user interface sections, the other user interface section(s) of the at least two user interface sections is (are) in non-display state(s).

[0017] This thus enables to prevent confusion by the user, occurring when displaying information on the specific user interface or giving an instruction to execute the process in the image processing section.

[0018] Specifically, when displaying the information regarding the process on one of the user interface sections, the other user interface section(s) is (are) set in the non-display state, i.e., no information on the image processing apparatus are not displayed. As a result, such problem of making the user confused by also looking at the display of the other user interface section can be prevented.

[0019] The at least two user interface sections of the image processing apparatus may be arranged such that

information regarding contents of the command entered by one of the user interface section displays in the other(s) of the at least two user interface sections.

[0020] According to the invention, the information related to the specific process in accordance with a user's instruction in the one of the at least two user interface sections is displayed in the other(s) of the at least two user interface sections. Namely, the information displayed in the other(s) of the at least two user interface sections corresponds to the operator's instruction, and therefore, for the operator, it is easy to recognize the contents of the displayed information, and such problem of making the user confused will not occur. Further, even if the information to be displayed in the other(s) of the at least two user interface sections are the information on the image process of low frequency of use, for example, as the displayed information is in response to the user's instruction, it is easy for the user to recognize the contents of the information. Namely, in the image processing apparatus having a plurality of user interface sections, by selectively using the plurality of user interface sections in an efficient manner, a still improved operability of the image processing apparatus can be realized.

[0021]

[EMBODIMENTS] The following will explain a digital copying machine in accordance with one embodiment of the present invention with reference to Figure 1 through Figure 6 as one example application of an image processing apparatus of the present invention.

[0022] As illustrated in Figure 2, a digital copying machine (image processing apparatus) 1 in accordance with the present embodiment includes a scanner unit 2 which serves as an image processing unit, and a printer unit 3 which serves as another image processing unit. The scanner unit 2 is provided for obtaining an electronic image data by electronically reading a document image. The printer unit 3 is provided for forming an image on a recording material based on the electronic image data. The scanner unit 2 is provided with a scanner-side operation panel section 4 which is conveniently situated for the user.

[0023] The scanner unit 2 and the printer unit 3 are supported by a supporting member in such a manner that the scanner unit 2 is placed right above the printer unit 3. These scanner unit 2 and the printer unit 3 are provided at an appropriate interval in between so that an operator (user) can operate the printer unit 3 placed under the

scanner unit 2 with ease.

[0024] The scanner-side operation panel 4 of the scanner unit 2 has a scanner-side user interface (user interface section) 5 formed thereon as shown in Figure 3. This scanner-side user interface 5 is provided for mainly displaying information including operation guide or operation state, etc., of the scanner unit 2. This scanner-side user interface 5 includes a scanner-side display panel 6 serving as a touch panel display, a set of scanner-side operation keys 7, and a scanner-side LED display section 8.

[0025] The scanner-side display panel 6 is constituted by a dot-matrix display screen and a transparent tablet formed thereon. This scanner-side display panel 6 displays detailed information or a set of operation command keys. The user can enter commands to execute modes of various kinds with respect to the digital copying machine 1 (image processing apparatus (image processing system)) by depressing a tablet according to the displayed information. On the right side of the scanner-side display panel 6 shown in Figure 3, provided is the set of scanner-side operation keys 7 for entering commands for other modes of various kinds with respect to the system, and the scanner-side LED display section 8

for displaying brief information on the state of the digital copying machine 1.

[0026] On the upper surface of the printer unit 3, provided is a printer-side user interface (user interface section) 10, for mainly displaying information regarding operation guides or an operating state, etc., of the printer unit 3. On the printer-side user interface 10, provided are a printer-side dot-matrix display panel 11 for displaying detailed information, and a printer-side LED display section 12 for displaying brief information. Further, provided in a vicinity of these members is a set of printer-side operation keys 13 for entering commands to execute the processing in modes of various kinds.

[0027] To the digital copying machine 1 having the foregoing arrangement, connected via a network are a plurality of external equipments, such as a personal computer, a telephone terminal equipment, etc., not shown. Then, the image data transmitted to the digital copying machine 1 from the external equipment via the interface, which is connected to the digital copying machine 1 via the network circuit, is once sent to an image processing section of the digital copying machine 1, to be subjected to a predetermined processing, and the image data are then reproduced as a recorded image on a

recording material such as paper, etc., in an image recording section.

[0028] The printer unit 3, which constitutes the digital copying machine 1 of the foregoing structure, is independently operable. Namely, the printer unit 3 is capable of outputting the reproduced image from the image recording section by recording or reproducing the image data on a recording material based on the received image data from a plurality of external equipments such as personal computers, telephone terminal equipments, etc., connected via the network.

[0029] The operations of the digital copying machine 1 in accordance with the present embodiment and the display structure of the user interface will be explained.

[0030] In order to realize the digital copying machine 1 as shown in Figure 2 wherein the scanner unit 2 and the printer unit 3 are combined, the printer unit 3 is provided on an upper surface of a high capacity feed unit 15, and the scanner unit 2 is set on a scanner support member 16 fixed to a part of the feed unit 15. Then, the scanner unit 2, the printer unit 3 and peripheral equipments (high capacity feed unit 15, etc.), are connected respectively using a cable, a connector, etc. As a result, an installation of the digital copying machine 1 is completed so as to be

capable of controlling the entire digital copying machine 1 and supplying current to the entire digital copying machine 1, i.e., to respective sections which constitute the image processing apparatus.

[0031] In the foregoing structure, when the operator powers on a switch of the digital copying machine 1, a predetermined voltage is supplied to each processing unit from a power supply circuit, and an initial checking (self-diagnostic checking) is performed for checking the state of each processing section. The result of this initial checking is displayed at least in either one of the scanner-side user interface 5 and the printer-side user interface 10 (hereinafter simply referred to as a user interface if both are not necessarily be distinguished). If the result of this initial checking indicates that an abnormality is not detected in any of the processing sections, it is determined that the image processing apparatus, i.e., the digital copying machine 1 is operable. On the other hand, if the result of the initial checking indicates some abnormality occurred at least in one of the processing sections, it is determined that the image processing apparatus, i.e., the digital copying machine 1 is disable.

[0032] As a result of this initial checking, if some

abnormality is detected and a message indicative of that the digital copying machine 1 is disable is displayed, the user is expected to call for service personnel. On the other hand, as a result of this initial checking, if any abnormality is not detected, and it is determined that the digital copying machine 1 is operable as an image processing apparatus, the digital copying machine 1 wherein the scanner unit 2 and the printer unit 3 are combined starts operating as the image processing apparatus. Namely, in the digital copying machine 1 of the foregoing structure, the processing of an image is executed as a system based on the contents of the command entered by the user interface while executing respective processing in the processing sections.

[0033] In the digital copying machine 1 in accordance with the present embodiment, upon confirming the connection of the scanner unit 2, the printer-side user interface 10 is set ineffective, and only the scanner-side user interface 5 is used in displaying information on the entire digital copying machine 1 or entering commands for all the processing to be executed in the digital copying machine 1. As a result, the problem of poor operability associated with the structure wherein the scanner-side user interface 5 and the printer-side user interface 10

respectively display information and enter commands can be prevented.

[0034] Namely, according to the foregoing digital copying machine 1 of the present embodiment, the scanner-side user interface 5 is used in displaying all the information and entering all the commands for the entire digital copying machine 1. It is therefore possible for the user to recognize the displayed information and the operator guidance with ease, and an improved operability can be ensured. Namely, the digital copying machine 1 of desirable operability without the problem of making the user confused can be realized.

[0035] Next, the schematic structures of the printer unit 3 and the scanner unit 2 of the digital copying machine 1 will be explained in reference to the block diagram of Figure 4 wherein each processing section is shown in a block.

[0036] Firstly, the schematic structure of the printer unit 3 will be explained. The printer unit 3 includes a process control unit (PCU) 30, a printer-side image processing section 31, a memory section 32, an image output section 33, a printer-side operation panel (OP) 34, a printer-side operation panel control unit (OCU) 35, a FAX board 36, an external equipment board 37, a

printer-side interface (I/F) 38 and a power supply circuit 39.

[0037] The process control unit 30 is provided for controlling the printer unit 3 as a whole. The printer-side image processing section 31 is provided for processing image data. The memory section 32 is provided for temporarily storing image data and various control data to be processed in the printer-side image processing section 31. The image output section 33 is provided for outputting an image based on the image data as processed in the image processing section 31.

[0038] The printer-side operation panel 34 is used in displaying variety of information on the printer unit 3, or entering commands by the user. This printer-side operation panel 34 is controlled by the printer-side operation panel control unit 35. The fax board 36 permits a facsimile communication with the external communication apparatus via the communication line. The external apparatus board 37 receives data from the host computer via the network line, and prints out the data as received. The printer-side interface 38 is provided for connecting the printer unit 3 and the scanner unit 2. The power supply circuit 39 is provided for supplying power to each of the processing sections of the digital

copying machine 1 upon a switch (SW) is powered on.

[0039] Next, the schematic structure of the scanner unit 2 will be explained. The scanner unit 2 includes a scanner control unit (SCU) 20, a scanner-side image processing section 21, a scanner-side image input section 23, a scanner-side operation panel (OP) 24, a scanner-side operation panel control unit (OCU) 25 and a scanner-side interface (I/F) 28.

[0040] The scanner control unit 20 is provided for controlling the scanner unit 2 as a whole, and the scanner-side image processing section 21 is provided for performing a predetermined process on the image data. The image input section 23 inputs image data of a original document in the scanner unit 2 as image data (electronic image data). The scanner-side operation panel 24 is used in displaying variety of information on the scanner unit 2 or entering commands by the user. This scanner-side operation panel 24 is controlled by the scanner-side operation panel control unit 25. The scanner-side interface 28 is provided for connecting the scanner unit 2 and the printer unit 3.

[0041] The scanner unit 2 and the printer unit 3 are connected by a connection cable 50 via the scanner-side interface 28 and the printer-side interface 38. By

connecting the scanner unit 2 and the printer unit 3, power can be supplied across the units, and control signals of various kinds and the image data can be transferred each other with ease. Here, for the connection cable, by adopting the one in which various functions are incorporated, the scanner unit 2 and the printer unit 3 can be connected with ease.

[0042] Next, the processes for setting the digital copying machine 1 ready to operate, i.e., for setting the digital copying machine 1 wherein the scanner unit 2 and the printer unit 3 are combined to be operable as the image processing unit will be explained referring to the flowchart of Figure 5.

[0043] When turning ON a power switch (SW) of the power circuit 39, predetermined power is supplied to respective processing sections of the scanner unit 2 and the printer unit 3, and in the meantime, the digital copying machine 1 (image processing apparatus) is subjected to checking.

[0044] When checking the digital copying machine 1, first, it is confirmed if the scanner unit 2 is connected to the printer-side interface 38 by the process control unit 30 of the printer unit 3 (S1). In this example, the scanner unit 2 is connected to the printer-side interface 38, and

thus the digital copying machine 1 is recognized in S1 as the image processing apparatus wherein the scanner unit 2 and the printer unit 3 are combined. Then, the printer-side user interface 10 of the printer unit 3 is set ineffective, and only the scanner-side user interface 5 of the scanner unit 2 is set effective (S2). Then, the digital copying machine 1 is subjected to further checking.

[0045] The process control unit 30 of the printer unit 3 and the scanner control unit 20 of the scanner unit 2 perform system checking respectively by checking respective processing sections to determine if the digital copying machine 1 as a whole is operable as a image processing apparatus (S3). In this system checking, if any abnormality is not detected in neither of the scanner unit 2 and the printer unit 3, and the digital copying machine 1 is confirmed to be operable as an image processing apparatus (S4), the scanner unit 2 and the printer unit 3 start being warmed up respectively to be ready to execute the processing of image data (S5). On the other hand, if an occurrence of some informality is recognized in the system, even in a part of the system (S4), the digital copying machine 1 as a whole is determined to be disable as the image processing apparatus. In this case, an error message is displayed in the scanner-side user interface 5,

to inform the user of the system as a whole is disable (S7).

[0046] Next, it is checked if any abnormality is detected in any part of the digital copying machine 1 while a warm-up process is being performed by the scanner unit 2 and the printer unit 3 after the warm-up process is started, i.e., after respective processing sections of the scanner unit 2 and the printer unit 3 start operating (S6). In this case also, if any abnormality is detected, the user is informed by the scanner-side user interface 5 of that the digital copying machine 1 as a whole is disable as a system (S7). On the other hand, if the warm-up process is completed without any problem (S8), the user is informed of that the digital copying machine 1 is operable (S9).

[0047] Then, upon receiving a command to execute a copy processing from the scanner-side user interface 5 on standby (S10), based on the image data of original document, as read out by the scanner unit 2, a copy processing is executed by the printer unit 3 according to the contents of the command (S11). Then, upon receiving the command to execute a FAX transmission processing from the scanner-side user interface 5 (S12), the image data of original document as read out by the scanner unit 2 is transferred to the FAX board 36 of the printer unit 3,

and after subjecting the image data as received to the compression process in accordance with a communication device of the transmitting end, and confirming the size, the image data is subjected to a predetermined processing, thereby performing the fax transmission processing with respect to the communication device of the transmitting end (S13).

[0048] Further, upon receiving a fax image from an external communication device via a communication line (S14), a message indicative of a receipt of the fax image, and a message indicative of that the image as received is output from the printer unit 3 are displayed in the scanner-side user interface 5. Then, a fax receiving process is performed by restoring the received image on the FAX board 36 of the printer unit 3, and printing out the resulting image from the image output section 33 after a predetermined process is performed in the printer-side image processing unit 31 (S15).

[0049] As in the foregoing fax receiving process, upon receiving the image data from the side of the host computer connected via the network line, i.e., from the external equipment (S16), a message indicative of that the image data is received from the external equipment, and a message indicative of that the received image is output

from the external equipment on the scanner-side user interface 5 are displayed. Then, the image received from the external equipment in the external apparatus board 37 of the printer unit 3 is developed, and in the printer-side image processing section 31, an external receiving process (printing process) is performed for printing out from the image output section 33 after applying a predetermined process in the printer-side image processing section 31 (S17).

[0050] The foregoing explanations have been given through the case where the digital copying machine 1 is operated under such condition where the printer unit 3 is connected to the scanner unit 2.

[0051] In the following, explanations will be given through the case where the scanner unit 2 is detached from the printer unit 3 for repairing, checking, or changes in network environment of the scanner unit 2.

[0052] In the case where the scanner unit 2 is detached from the system structure of the digital copying machine 1, i.e., in the case of taking out the connection cable 50 for connecting the scanner unit 2 and the printer unit 3, the connection cable 50 is detached after once turning off the power of the digital copying machine 1. Then, after taking out the connection cable 50, the power

switch is turned ON again. In this state, a predetermined power is supplied to each processing section, and in the meantime, a checking of the system is performed.

[0053] In the system checking, first, it is confirmed if the scanner unit 2 is connected to the printer-side interface 38 (S1) by the process control unit 30 of the printer unit 3. Here, because the scanner unit 2 is not connected, it is recognized as a network printer constituted by an independently operable printer unit 3. As illustrated in the flowchart of Figure 6, the printer-side user interface 10 is set effective (S20), and the system is subjected to further checking.

[0054] Then, in the printer unit 3, the process control unit 30 checks various processing sections, and it is confirmed if the digital copying machine 1 as a whole is capable of performing an image processing operation (S21). Then, in the system checking, if it is confirmed that any abnormality has occurred in the printer unit 3, and the system is capable of performing an image processing operation (S22), the printer unit 3 starts being warmed up to be ready to execute the processing of image data (S23). In the system checking of S21, if some abnormality is

detected even in a part of the network printer system constituted by the independently operable printer unit 3 (S22), an error message is displayed in the printer-side user interface 10, so as to inform the user of that the system is disable (S25).

[0055] Next, it is checked if some abnormality is detected in a part of the printer unit 3 (S23) while a warm-up process is being performed after starting the warming up process of the printer unit 3, i.e., after the respective processing sections of the printer unit 3 start operating (S24), a message indicative of that a system is disable is displayed in the printer-side interface 10 to inform the user of that the printer unit 3 is disable (S25). On the other hand, in the case where the warm-up process is completed without any problem (S26), a message indicative of that the printer unit 3 is operable is displayed in the printer-side user interface 10 (S27) to inform the user of that the printer unit 3 is operable as a network printer.

[0056] Then, upon receiving the image data from the side of a host computer connected via the network line on standby, i.e., upon receiving the image data from an external equipment (S28), a message indicative of that the image data is received from the external equipment and a

message indicative of that the received image is output from the printer unit 3 are displayed in the printer-side interface 10. Then, the processing of the image data received from the external equipment (print processing) is executed by developing the received image on the external equipment board 37 of the printer unit 3, and printing out the received image from the image output section after having gone through a predetermined processing (S29).

[0057] In the foregoing, explanations have been given through the case wherein as the image processing apparatus, a digital copying machine is prepared beforehand by connecting the scanner unit 2 and the printer unit 3 via the connection cable 50, and then, the scanner unit 2 is detached from the digital copying machine 1 for repairing, checking, etc. However, the above explanations can be applied also to the case wherein the network printer constituted by the independently operable printer unit 3 is prepared beforehand, and then the scanner unit is attached thereto.

[0058] Namely, in the power-off state of the network printer, the scanner unit 2 and the printer unit 3 are connected using the connection cable 50, and then the switch is powered on. Then, upon turning ON the power,

the structure of the image processing unit is switched after confirming the connected state of the scanner unit 2.

Namely, in the system checking after turning on the power switch, the digital copying machine 1 is recognized as an image processing apparatus wherein the scanner unit 2 and the printer unit 3 are combined.

[0059] In the above explanations, all of the printer-side interfaces 10 are set ineffective; however, it is possible to display a minimum amount of information without adversely affecting the scanner-side user interface 5. Namely, the operability of the scanner-side user interface 5 can be ensured for displaying an overall information on the digital copying machine 1, and information can be displayed on the printer-side user interface 10.

[0060] For example, in order to recognize the operating state of the printer unit 3, it may be arranged such that in the printer-side LED display section 12, an LED lamp for informing the state of, for example, "being charged", "being warmed up", "on standby", "abnormality", etc., may be turned ON because such minimum amount of information can be displayed without the problem of making the user confused and thus without lowering the operability of the digital copying machine 1.

[0061] As described, the image processing apparatus of the present invention includes a plurality of user interface sections, and in the normal state, only the specific user interface section is used of all the plurality of user interface sections, other interface section(s) is (are) used only when necessary. As a result, the data can be provided to the operator. Namely, by effectively utilizing a plurality of user interface sections, the operability of the image processing apparatus can be improved. In the present embodiment, the image processing apparatus provided with two user interface sections is adopted; however, the image processing apparatus provided with three or more user interface sections may be equally adopted.

[0062] The image processing apparatus of the present invention may be arranged so as to include: an image processing section for carrying out a specific processing of image data; and first and second user interface sections for respectively displaying information regarding the processing of image data and for entering commands on the processing of image data, wherein commands for the image processing section to execute the processing are given in such a manner that when the command is entered by the first user interface section, the second user

interface section is set effective as necessary.

[0063] According to the foregoing structure, the first user interface section is used in usual state, and the second user interface section is set effective as necessary so that the second user interface can be used in displaying information and entering commands. As described, by selectively utilizing the plurality of user interface sections, even for a multifunctional image processing apparatus, a user friendly system can be realized without the problem of significant reduction in operability nor making the operator confused.

[0064] The image processing apparatus of the present invention may be arranged so as to include: an image processing section for carrying out a specific processing of image data; and first and second user interface sections for respectively displaying information regarding the processing of image data and for entering commands on the processing of image data, wherein commands on information regarding the first image processing are entered by the first user interface section, and commands on information regarding the second image processing are entered by the second user interface section.

[0065] According to the foregoing structure, by selectively using the first user interface section and the

second user interface section according to the need, even for a multifunctional image processing apparatus, a user friendly system can be realized without the problem of significant reduction in operability nor making the operator confused.

[0066] The image processing apparatus of the present invention may be arranged so as to include: an image processing section for carrying out a specific processing of image data; and first and second user interface sections for respectively displaying information regarding the processing of image data and for entering commands on the processing of image data, wherein commands on information regarding the first image processing are entered by the first user interface section, and commands on information regarding the second image processing are entered by the first user interface section and the second user interface section.

[0067] According to the foregoing structure, the first user interface section is used in usual state, and a plurality of user inter sections are used as necessary by also using the second user interface section in displaying information or entering commands. Therefore, even for a multifunctional image processing apparatus, a user friendly system can be realized without the problem of

significant reduction in operability nor making the operator confused.

[0068] It may be further arranged such that the second user interface section is set ineffective in the usual state, and is set effective only when necessary to use it in displaying information regarding the second processing of image data and entering commands on the second processing.

[0069] According to the foregoing structure, the first user interface section is used in usual state, and the second user interface section is set effective only when necessary to use it in displaying information on the second processing of image data and entering commands of the second processing. Therefore, even for a multifunctional image processing apparatus, a user friendly system can be realized without the problem of significantly reducing the operability nor making the operator confused.

[0070]

[EXAMPLE] <Example 1> The following descriptions will explain one example of the present invention in reference to Figure 1 to Figure 7.

[0071] Figure 1 and Figure 7 show the scanner-side user interface 5 and the printer-side user interface 10

explained   earlier (hereinafter simply referred to as a user interface if both are not necessarily be distinguished).

[0072] The user interface to be used when performing the basic operation of the digital copying machine 1 including the scanner unit 2 and the printer unit 3 will be explained in reference to Figure 1.

[0073] As illustrated in these figures, an image processing screen 45 is displayed on the scanner-side display panel 6. On the image processing screen 45, displayed are a set of basic function keys 45a regarding basic functions (basic operations) of the digital copying machine 1 such as "copy density", "sheet", "magnification", etc., and a set of special function keys 45b regarding specific functions (specific processing) such as "function", "both-sided", "sort", etc.

[0074] Then, by depressing the basic function keys 45a such as "copy density", "sheet", "magnification", etc., on the scanner-side display screen 45, a detailed selection can be made or a command to instructions corresponding to the key depressed can be made with respect to the scanner-side display panel 6.

[0075] Namely, a window (not shown) is displayed for making detailed selection or instruction on "copy density",

"sheet", "magnification", etc., in a vicinity of (depressed) keys (for example, in the area on the right hand side of the scanner-side display panel 6), and the user can select a mode or can send an instruction as desired. Here, the printer-side user interface 10 is set ineffective, and in this state, the printer-side display panel 11 is a blank screen (non-display state) 60 in which no information is displayed.

[0076] As described, the selection or instruction on the basic operation as the digital copying machine 1 is performed using the scanner-side user interface 5 even for the process regarding the printer unit 3. In this way, it is possible to prevent a lower operability of displaying the information by the plurality of user interfaces separately. Therefore, in the typically used basic operation, the problem of making the operator confused by information displayed on the plurality of user interfaces can be surely prevented.

[0077] Namely, when performing a basic operation as the digital copying machine 1, a selection of a function or a command to execute the function can be made using only the scanner-side user interface 5. Therefore, the user can make a selection or enter a command for basic operation of the digital copying machine 1 using only the

scanner-side user interface 5.

[0078] Namely, when performing a basic operation as the digital copying machine 1, a selection or entering of a command can be performed by means of only the scanner-side user interface 5. In this way, it is not necessary for the user to check a plurality of user interfaces, and an improved operability of the digital copying machine 1 can be achieved.

[0079] On the other hand, upon depressing any key in the set of special function keys 45b such as "function", "both-sided", or "sort", etc., indicative of special function (specific processing) of the digital copying machine 1, as illustrated in Figure 7, the right of entering commands is switched to the printer-side user interface 10.

[0080] Namely, upon depressing any key in the set of special function keys 45b, in the scanner-side user interface 5, the user is informed of that a special key is selected. Then, the printer-side user interface 10 becomes effective, and a mode in which a special function of the digital copying machine 1 is operable is displayed.

[0081] For example, upon selecting the "function" key (mode) from the set of special function keys 45b, when depressing the key, as illustrated in Figure 7, on the scanner-side display panel 6 of the scanner-side user

interface 5, a function key selection screen 46 in which a "function" key is displayed black/white inverted. Further, the printer-side user interface 10 becomes effective, and on the printer-side display panel 11, a special function selection screen 51 is displayed, which shows a mode permitting a special function of the digital copying machine. Then, in the special function selection screen 51, a special function as desired can be selected by scrolling the special function displayed on the printer-side display panel 11 and operating a confirmation key 13b displayed black-and-white inverted, whereby a command to execute the special function can be entered.

[0082] As described, the digital copying machine 1 of the present embodiment is arranged such that when making a selection or entering commands on the special function (specific processing), the printer-side user interface 10 is used as other user interface. As a result, a special function can be set in an efficient manner without lowering the operability for the user.

[0083] As described, the digital copying machine of the present embodiment is arranged such that when performing a basic function as the digital copying machine, only one user interface is used, and other user interface(s) is (are) set ineffective, and only upon selecting a special

function of the digital copying machine in the user interface being used, the other user interface(s) is (are) set effective, and the right of entering commands of the digital copying machine is switched to the other user interface(s). As a result, an improved operability of the user interface can be realized in the image processing apparatus having a plurality of user interfaces.

[0084] <Example 2> The following descriptions will explain another example of the present invention in reference to Figures 1, 8 and 9.

[0085] When performing the basic operation of the digital copying machine 1, only the scanner-side user interface 5 is used as the user interface, and the printer-side user interface 10 is set ineffective, to attain an improved operability of the digital copying machine 1 as in the case of the Example 1. Therefore, explanations thereof shall be omitted in this example.

[0086] The scanner-side user interface 5 in the case of depressing any one of the set of special function keys 45b such as "function", "both-sided", "sort", etc., shown in Figure 1 will be explained in reference to Figure 8.

[0087] Figure 8 shows the display of the interface in the case where the "function" is selected by depressing the "function" key of the set of special function keys 45b as a

special function of the digital copying machine 1. As illustrated in Figure 8, upon depressing the "function" key, the display of the scanner-side display panel 6 of the scanner-side user interface 5 is switched to a special function selection screen 47 for the selection of a specific function. Further, a list of keys for the special functions selective as functions of the digital copying machine 1 is displayed in the scanner-side display panel 6. In this state, the list of special functions is displayed in the scanner-side display panel 6, and thus the printer-side display panel 11 of the printer-side user interface 10 as other user interface is the blank screen 60 where no special function is displayed.

[0088] Then, from the list of the special functions displayed in the special function selection screen 47 of the scanner-side display panel 6, by depressing at least one special function key as desired, the corresponding special function is selected, and the processing of an image in the selected mode can be performed in the digital copying machine 1.

[0089] Specifically, upon depressing at least one of the special function keys as desired from the list of the special function keys, a display which informs the user of the selection of the special function is displayed in the

scanner-side user interface 5. In the meantime, the printer-side user interface 10 becomes effective, and the detailed contents on the processing of the special function of the digital copying machine 1 can be set by the printer-side user interface 10.

[0090] For example, upon selecting a "back margin" key (mode) of the special function selection screen 47 of the scanner-side display panel 6, as illustrated in Figure 9, the back margin key displayed on the scanner-side display panel 6 of the scanner-side user interface 5 is black-and-white inverted upon depressing the back margin key, and then the printer-side user interface 10 becomes effective.

[0091] Specifically, a back margin function setting screen 52 for displaying the detailed contents on the processing the back margin function as selected as the specific function is displayed on the printer-side display panel 11. Then, it becomes possible for the user to set the contents of the processing in the back margin function by the printer-side display panel 10. Further, when necessary, commands for the detailed contents of the back margin function are entered by operating the selection key 13a. Then, by operating the confirm key 13b, the detailed contents of the processing as selected can be confirmed.

[0092] As described, the digital copying machine 1 of the present embodiment is arranged such that in the state where the special function is selected by the scanner-side user interface section 5, information on the special function is displayed in the printer-side user interface 10 to allow the user to make selections on the detailed contents of the special function as selected. Namely, on the printer side user interface 10, information on the contents of the commands entered by the scanner-side user interface section is displayed. As a result, an image processing apparatus provided with the user interface sections of desirable operability, which permits the user to effectively performs necessary setting for the special function can be realized.

[0093]

[EFFECTS OF THE INVENTION] As described, the image processing apparatus of the present invention includes at least two user interface sections, and in response to a command entered by one of the at least two user interface sections, the other of the at least two user interface sections changes its display state.

[0094] Thus, it is possible to make a selective use of the plurality of user interface sections according to the need, and prevents the user to be confused. Therefore, an

effect is attained such that a user-friendly image processing apparatus which offers improved operability is provided, without causing any confusion to the user.

[0095] When information is displayed with regards to processing in response to image information in one of the user interface sections of the image processing apparatus, it is preferable for the other user interface section to be in non-display state.

[0096] It is thus possible to further securely prevent the occurrence of confusion by the user due to the information displayed on the other user interface section, thereby attains the effect such that a more operable image processing apparatus is provided.

[0097] The image processing apparatus may be arranged such that information regarding contents of the command entered by one of the at least two user interface sections displays in the other(s) of the at least two user interface sections.

[0098] This thus allows to display the information regarding the contents of the command entered by one of the at least two user interface sections. Consequently, the user can easily understand the contents of the information displayed in the user interface section. Therefore, the effect is attained such that an image

processing apparatus having a further high operability is provided.

[BRIEF DESCRIPTION OF THE DRAWINGS]

[Fig. 1] The drawing is a typical depiction explaining a user interface for basic operations of a digital copying machine in accordance with the present embodiment.

[Fig. 2] The drawing is a perspective view illustrating the overall structure of the digital copying machine of the present embodiment.

[Fig. 3] The drawing is a plan view illustrating the structure of a scanner-side user interface and a printer-side user interface of the digital copying machine.

[Fig. 4] The drawing is a block diagram illustrating the schematic structure of the digital copying machine.

[Fig. 5] The drawing is a flowchart which explains the processes till the digital copying machine starts operating.

[Fig. 6] The drawing is a flowchart which explains the processes till the digital copying machine from which a scanner unit is detached starts operating as a network computer.

[Fig. 7] The drawing is a typical depiction explaining a user interface upon selecting a specific function key

with regard to a digital copying machine in accordance with the first example.

[Fig. 8] The drawing is a typical depiction explaining the user interface upon selecting a specific function key with regard to a digital copying machine in accordance with the second example.

[Fig. 9] The drawing is a typical depiction explaining the user interface upon selecting a specific function key with regard to a digital copying machine in accordance with the second example.

[REFERENCE NUMERALS]

1 Digital copying machine (image processing apparatus)

5 Scanner-side user interface (user interface section)

10 Printer-side user interface (user interface section)

21 Scanner-side image processing section (image processing section)

31 Printer-side image processing section (image processing section)

[TITLE OF THE DOCUMENT]   ABSTRACT

[ABSTRACT]

[OBJECT] To attain a desirable operability in an image processing apparatus having a plurality of user interface sections.

[MEANS TO ACHIEVE THE OBJECT] A digital copying machine provided with a scanner unit and a printer unit is arranged such that a display state of a printer-side display panel 11 of a printer-side user interface 10 changes its display state in response to a command entered by a scanner-side user interface 5.

[SELECTED DRAWINGS]   Fig. 1